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COMPANY PROFILE

Established in 1996, Xinxiang Richful Lube Additive Co., Ltd. is a national grade hi-tech enterprise with the complete scientific research, production and sales, and owns several domestic and international technical patents. Our products range from lubricant additives to specialty chemical products for papermaking. We are devoted to turning into the technology leading lubricant additive production and R&D base for providing higher performance and more eco-friendly products for worldwide lubricant manufacturers.

In constant pursuit of creating values for customer and satisfying customer's individuation demand, the innovation is our soul. Through more than ten years of efforts, we have achieved outstanding results in specialty chemical products for papermaking, and have become the strategic supplier of the best global papermaking enterprise. What's more, we have generated a professional and passionate technical team. Since we stepped into the lubricant additive industry in 2002, supported by continuous innovation of technical team, we have grown into a professional lubricant additive production base with an annual capacity of 80,000mt and over 40 product categories within a few years.

Through past more than ten years' market practice, we have won the favor of some well-known international companies, and established a stable cooperative relationship. Continuous innovation research & development and product quality stability can achieve the advanced level in the industry.

We are not satisfied with the progress we have made so far. Based on the open and comprehensive spirit, we are ready to establish the innovation cooperation mode with mutual benefit and provide products and service to fulfill customer higher demand with our own creative work in lubricant additive industry.

RF1104 Low Base Synthetic Calcium Sulfonate

●Product Introduction

Low base synthetic calcium sulfonate is one of the sulfonate salt series lubricant additives products we produce. It's mainly made from long-chain linear alkylbenzene sulfonic acid. As a major metal detergent, this product boasts excellent detergency, anti-rust property and high-temperature detergency, is widely used for different ICE oils.

●Product Technical Index

Item	Typical Value	Test Method
Density (20℃), kg/m ³	937	ASTM D4052
Kinematic Viscosity (100℃), mm ² /s	22	ASTM D445
Flash Point (COC), °C	205	ASTM D92
Total Base Number, mgKOH/g	24	ASTM D2896
Ca Content, m%	2.2	ASTM D4951
S Content, m%	2.1	ASTM D1552
Water Content, m%	0.04	ASTM D95

●Package, Storage and Transportation

Packed in 200 liters iron drum or according to user's requirement. Transportation mode is by container or truck.

The maximum storage temperature shall not exceed 45℃.

This product is non-flammable, non-explosive, and non-corrosive, and it is same as petroleum products in terms of safety, environmental protection, use and other aspects, thus it needs no special protection.

The product is stored with a shelf life of 2 years, and it should avoid contact with strong antioxidant when use.

In case of accidental contact with skin, wash it off thoroughly with water and detergent.

RF1105 Medium Base Synthetic Calcium Sulfonate

●Product Introduction

Medium base synthetic calcium sulfonate is one of the sulfonate salt series lubricant additives products we produce. It's mainly made from long-chain linear alkylbenzene sulfonic acid by means of neutralization and alkalization reaction. This is a main metal detergent, and boasts excellent acid neutralization capacity, anti-rust property and high-temperature detergency, thus it is widely used for different ICE oils, meanwhile it can be used to blend rust preventing oil.

●Product Technical Index

Item	Typical	Test Method
Density (20℃), kg/m ³	1015	ASTM D4052
Kinematic Viscosity (100℃), mm ² /s	25	ASTM D445
Flash Point (COC), °C	200	ASTM D92
Total Base Number, mgKOH/g	165	ASTM D2896
Ca Content, m%	6.6	ASTM D4951
S Content, m%	1.9	ASTM D1552
Water Content, m%	0.05	ASTM D95

●Package, Storage and Transportation

Packed in 200 liters iron drum or according to user's requirement. Transportation mode is by container or truck.

The maximum storage temperature shall not exceed 45℃.

This product is non-flammable, non-explosive, and non-corrosive, and it is same as petroleum products in terms of safety, environmental protection, use and other aspects, thus it needs no special protection.

The product is stored with a shelf life of 2 years, and it should avoid contact with strong antioxidant when use.

In case of accidental contact with skin, wash it off thoroughly with water and detergent.

RF1106 Overbased Synthetic Calcium Sulfonate

●Product Introduction

Overbased synthetic calcium sulfonate is one of the sulfonate salt series lubricant additives products we produce. It's mainly made from long-chain alkylbenzene sulfonic acid by means of neutralization and high alkalization reaction. This is a main metal detergent, and boasts excellent acid neutralization capacity, anti-rust property and high-temperature detergency, so it is widely used for different ICE oils.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Red brown transparent viscous liquid	Visual Inspection
Flash Point (COC), °C	205	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	45	ASTM D445
Density (20°C), kg/m ³	1110	ASTM D4052
Total Base Number, mgKOH/g	311	ASTM D2896
Ca Content, m%	12.0	ASTM D4951
S Content, m%	1.52	ASTM D1552
Water Content, m%	0.03	ASTM D95

●Package, Storage and Transportation

Packed in 200 liters iron drum or according to user's requirement. Transportation mode is by container or truck.

The maximum storage temperature shall not exceed 45°C.

This product is non-flammable, non-explosive, and non-corrosive, and it is same as petroleum products in terms of safety, environmental protection, use and other aspects, thus it needs no special protection.

The product is stored with a shelf life of 2 years, and it should avoid contact with strong antioxidant when use.

RF1106D Super Overbased Synthetic Calcium Sulfonate

●Product Introduction

With long-chain alkylbenzene sulfonic acid as a main raw material, super overbased synthetic calcium sulfonate is produced by neutralization and super high alkalization reaction. The product has excellent alkaline storage property, good oil solubility and strong acid neutralization capability, and it can immediately neutralize organic acid and inorganic acid in oil; meanwhile it also has excellent high-temperature detergency and thermal stability. It is a preferred additive for blending over-based marine cylinder oil.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Red brown transparent viscous liquid	Visual Inspection
Flash Point (COC), °C	200	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	130	ASTM D445
Density (20 °C), kg/m ³	1200	ASTM D4052
Total Base Number, mgKOH/g	408	ASTM D2896
Ca Content, m%	15.0	ASTM D4951
S Content, m%	1.5	ASTM D1552
Water Content, m%	0.03	ASTM D95

●Package, Storage and Transportation

Packed in 200 liters iron drum or according to user's requirement. Transportation mode is by container or truck.

The maximum storage temperature shall not exceed 45°C.

This product is non-flammable, non-explosive, and non-corrosive, and it is same as petroleum products in terms of safety, environmental protection, use and other aspects, thus it needs no special protection.

The product is stored with a shelf life of 2 years, and it should avoid contact with strong antioxidant when use.

In case of accidental contact with skin, wash it off thoroughly with water and detergent.

RF1106E Super Overbased Synthetic Calcium Sulfonate for Grease

●Product Introduction

With heavy alkylbenzene sulfonic acid as a main raw material, super overbased synthetic calcium sulfonate RF1106E is produced by neutralization and super high alkalization reaction. It is mainly used in the production of calcium sulfonate grease. The product has excellent high temperature performance, mechanical stability, EP & antiwear and water resistance performance.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Red-brown viscous liquid	Visual Inspection
Density(20℃), kg/m ³	1225	ASTM D4052
Kinematic Viscosity (100℃), mm ² /s	130	ASTM D445
Flash Point(COC), °C	210	ASTM D92
Total Base Number, mgKOH/g	425	ASTM D2896
Ca Content, m%	15.5	ASTM D4951
S Content, m%	1.6	ASTM D1552
Water Content, m%	0.06	ASTM D95

●Package, Storage and Transportation

Packed in 200 liters iron drum or according to user's requirement. Transportation mode is by container or truck.

The maximum storage temperature shall not exceed 45℃.

This product is non-flammable, non-explosive, and non-corrosive, and it is same as petroleum products in terms of safety, environmental protection, use and other aspects, thus it needs no special protection.

The product is stored with a shelf life of 2 years, and it should avoid contact with strong antioxidant when use.

In case of accidental contact with skin, wash it off thoroughly with water and detergent.

RF1107 Super Overbased Synthetic Magnesium Sulfonate

●Product Introduction

Super Overbased Synthetic Magnesium Sulfonate is one of the series of lubricant additives produced by us. It's mainly made from long-chain linear alkylbenzene sulfonic acid by means of neutralization and high alkalization reaction. As a major metal detergent, this product boasts excellent acid neutralization capacity, good anti-rust property and high-temperature detergency, so it is widely used for different ICE oils.

●Product Technical Index

Item	Typical Value	Test Method
Flash Point(COC), °C	180	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	148	ASTM D445
Density(20°C), kg/m ³	1113	ASTM D4052
Total Base Number, mgKOH/g	404	ASTM D2896
Mg Content, m%	9.0	ASTM D4951
Water Content, m%	0.07	ASTM D95

●Package, Storage and Transportation

Packed in 200 liters iron drum or according to user's requirement. Transportation mode is by container or truck.

The maximum storage temperature shall not exceed 45°C.

This product is non-flammable, non-explosive, and non-corrosive, and it is same as petroleum products in terms of safety, environmental protection, use and other aspects, thus it needs no special protection.

The product is stored with a shelf life of 2 years, and it should avoid contact with strong antioxidant when use.

In case of accidental contact with skin, wash it off thoroughly with water and detergent.

RF1121 Medium based Sulfurized Calcium Alkyl Phenate

●Product Introduction

The medium based sulfurized calcium alkyl phenate is made from dodecylphenol by means of sulfurization, neutralization, and medium alkalization. It has wonderful high-temperature detergency, remarkable resistance to oxidation, resistance to corrosion, considerable acid-neutralization, demulsibility and oil solubility. It has preferable compatibility with other additives and has active effect in reducing carbon deposition of piston top ring groove, and it is widely used to blend middle & high grade ICE oil.

●Product Technical Index

Item	Typical Value	Test Method
Flash Point (COC), °C	190	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	35	ASTM D445
Density (20 °C), kg/m ³	1000	ASTM D4052
Total Base Number, mg KOH/g	160	ASTM D2896
Ca Content , m%	5.6	ASTM D4951
S Content ,m%	2.4	ASTM D1552
Water Content, m%	0.02	ASTM D95

●Features

Besides excellent performances, it has the advantages of light chroma, low turbidity. Its compound 5w/30SJ grade oil in 7.2% dosage SJ Gasoline oil additive package has passed MS III E, VE, IID, CRCL-38 engine bench assessment test and all the lab tests requested by API SJ Gasoline engine oil.

●Package, Storage and Transportation

It shall be packed in iron barrel, 200L/barrel or packed according to the customer's requirements. Suitable for container or automobile.

For highest storage temperature, it shall not surpass 45°C. This product is non-flammable, non-explosive, and non-corrosive. In terms of safety, environmental protection and use, it is equal to general petroleum products, don't need the special protection. Avoid contact with strong oxidizer when use it, shelf life is 2 years.

In case of accidental contact with skin, wash it off thoroughly with water and detergents.

RF1122 Overbased Sulfurized Calcium Alkyl Phenate

●Product Introduction

The over based sulfurized calcium alkyl phenate is made from dodecylphenol by means of sulfurization, neutralization and high alkalization reaction. This product is a kind of widely used lubricant additive of comprehensive performance, it has extremely good acid neutralization capacity and high-temperature detergency, excellent oxidation resistance and corrosion control as well as good emulsion resistance and oil solubility. It's compatible with sulfonates, alkenyl succinimide, ZDDP and other additives. It has prominent effect in reducing top-piston ring carbon and is widely used to blend middle and high grade ICE oils.

●Product Technical Index

Item	Typical Value	Test Method
Flash Point (COC), °C	200	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	295	ASTM D445
Density (20 °C), kg/m ³	1088	ASTM D4052
Total Base Number, mg KOH/g	276	ASTM D2896
Ca Content, m%	10.1	ASTM D4951
S Content, m%	3.2	ASTM D1552
Water Content, m%	0.02	ASTM D95

●Features

Besides excellent performances, it has the advantage of light chroma; lower corrosion of copper and lead.

●Package, Storage and Transportation

For highest storage temperature, it shall not surpass 45°C. This product is non-flammable, non-explosive, and non-corrosive. In terms of safety, environmental protection and use, it is equal to general petroleum products, don't need the special protection. Avoid contact with strong oxidizer when use it, shelf life is 2 years.

In case of accidental contact with skin, wash it off thoroughly with water and detergents.

RF1123 Super Overbased Sulfurized Calcium Alkyl Phenate

●Product Introduction

RF1123 is a kind of widely used lubricant additive of comprehensive performance, it has extremely good acid neutralization capacity, better antioxidation, abrasion resistance and larger base number than the similar products. It also has excellent detergency and dispersion effects and hydrolysis stability.

●Product Technical Index

Item	Typical Value	Test Method
Flash Point (COC), °C	200	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	400	ASTM D445
Density (20 °C), kg/m ³	1110	ASTM D4052
Total Base Number, mg KOH/g	302	ASTM D2896
Ca Content, m%	11.0	ASTM D4951
S Content, m%	3.0	ASTM D1552
Water Content, m%	0.02	ASTM D95

●Features

Besides excellent performances, it has the advantage of light chroma; lower corrosion of copper and lead, it can be used to blend high grade ICE oil.

●Package, Storage and Transportation

For highest storage temperature, it shall not surpass 45°C. This product is non-flammable, non-explosive, and non-corrosive. In terms of safety, environmental protection and use, it is equal to general petroleum products, don't need the special protection. Avoid contact with strong oxidizer when use it, shelf life is 2 years.

In case of accidental contact with skin, wash it off thoroughly with water and detergents.

RF1151 Mono Polyisobutylene Succinimide Ashless Dispersant

●Product Introduction

RF1151 is Mono Polyisobutylene Succinimide Ashless Dispersant from high reactive polyisobutylene, with excellent low temperature detergency capability and good solubility of high temperature soot. It can be widely used in modulating high-grade internal combustion engine oil. It doesn't contain chlorine, it has preferable compatibility with detergent and antioxidant and corrosion inhibitors.

●Product Technical Index

Item	Typical value	Test method
Appearance	Viscous clear liquid	Visual inspection
Kinematic Viscosity (100℃), mm ² /s	180	ASTM D445
Total Base Number, mgKOH/g	50	ASTM D2896
N content, m%	2.1	ASTM D3228
Flash Point (COC), °C	200	ASTM D92
Color Number (diluted)	3.0	ASTM D1500

●Package, Storage and Transportation

The product is packed with iron barrels, net weight of 170Kg/barrel, suitable for all means of transport.

For short-term storage and transportation, the temperature of the product shall not surpass 75℃; for long-term storage, it shall not surpass 45℃. The shelf life of this product is 24 months. And it shall be stored in dry, cleaning, and ventilated warehouse.

In case of accidental contact with skin, wash it off thoroughly with water and detergents.

RF1154 Polyisobutylene Succinimide

●Product Introduction

RF1154 (Polyisobutylene Succinimide) is an ashless dispersant prepared from high reactive polyisobutylene ($M_n=1000$), with better detergency capability, it can inhibit the carbon deposit and the formation of varnish film. It doesn't contain chlorine, it has preferable compatibility with detergent and antioxidant and corrosion inhibitors.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Transparent viscous liquid	Visual Inspection
Kinematic Viscosity (100°C), mm ² /s	155	ASTM D445
Total Base Number, mgKOH/g	26	ASTM D2896
N Content, m%	1.3	ASTM D3228
Flash Point (COC), °C	200	ASTM D92
Color Number (diluted)	1.8	ASTM D1500

●Package, Storage and Transportation

The product is packed with iron barrels, net weight of 170Kg/barrel, suitable for all means of transport.

For short-term storage and transportation, the temperature of the product shall not surpass 75°C; for long-term storage, it shall not surpass 45°C. The product is offered with a guarantee period of 24 months, store in dry, cleaning, and ventilated warehouse.

In case of accidental contact with skin, wash it off thoroughly with water and detergents.

RF1161 High MW Polyisobutylene Succinimide Ashless Dispersant

●Product Introduction

RF1161 is High MW Polyisobutylene Succinimide Ashless Dispersant from high reactive polyisobutylene, with better detergency capability than low molecular weight ashless dispersant and good solubility of high temperature stability. It can inhibit the generation of carbon deposit and film and can be widely used to modulate high-grade internal combustion engine oil. It doesn't contain chlorine, it has preferable compatibility with detergent and antioxidant and corrosion inhibitors.

●Product Technical Index

Item	Typical value	Test method
Appearance	Viscous clear liquid	Visual inspection
Kinematic Viscosity (100°C), mm ² /s	370	ASTM D445
Total Base Number, mgKOH/g	22	ASTM D2896
N Content, m%	1.1	ASTM D3228
Flash Point, °C	200	ASTM D92
Color Number (diluted)	3.0	ASTM D1500

●Package, Storage and Transportation

The product is packed with iron barrels, net weight of 170Kg/barrel, suitable for all means of transport.

For short-term storage and transportation, the temperature of the product shall not surpass 75°C; for long-term storage, it shall not surpass 45°C. The shelf life of this product is 24 months. And it shall be stored in dry, cleaning, and ventilated warehouse.

In case of accidental contact with skin, wash it off thoroughly with water and detergents.

RF2202 Antioxidant and Corrosion Inhibitor

●Product Introduction

RF2202 is Zinc Butyl Octyl Primary Alkyl Dithiophosphate (ZDDP). This product features favorable anti-oxidation and anti-corrosion performance and anti-wear and extreme pressure properties. It can effectively protect engine bearings from corrosion, and prevent oil viscosity growth due to oxidation in a high temperature. The product is light in color and nice in oil solubility and additive compatibility. It can be widely adopted in various industrial lubricating oils such as gear oil and hydraulic oil. Combined with detergents and dispersants, the product can be used to produce all grades engine oils. The dosage is 0.5%-3.0%.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Amber transparent liquid	Visual Inspection
Color Number	0.8	ASTM D1500
Flash Point (COC), °C	195	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	11.6	ASTM D445
Density (20°C) , kg/m ³	1092	ASTM D4052
S Content, m%	15.7	ASTM D1552
P Content, m%	7.6	ASTM D4951
Zn Content, m%	9.0	ASTM D4951
pH Value	5.9	SH/T 0394-1996, Annex A
Water Content, m%	0.01	ASTM D95

●Package, Storage and Transportation

The product is packed with iron barrels, with a net weight of 200Kg/barrel, suitable for all means of transport.

For storage and transportation temperature, it shall not surpass 45°C. The product is offered with a guarantee period of two years.

In case of accidental contact with skin, wash it off thoroughly with water and detergents.

RF2203 Antioxidant and Corrosion Inhibitor

●Product Introduction

RF2203 is Zinc Dioctyl Primary Alkyl Dithiophosphate. This product features excellent oxidation resistance, corrosion resistance, and anti-wear and extreme pressure properties, particular high thermal stability, and favorable oil solubility, additive compatibility, and resistance to emulsification. It can be compounded with sulfonate detergents and dispersants to apply in high-grade diesel engine oils, or compounded with other additives to apply in anti-wear hydraulic oils. The dosage is 0.5%-3.0%.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Light yellow to amber transparent liquid	Visual Inspection
Color Number	0.6	ASTM D1500
Flash Point (COC), °C	200	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	25.5	ASTM D445
Density (20°C), kg/m ³	1113	ASTM D4052
S Content, m%	16.6	ASTM D1552
P Content, m%	7.9	ASTM D4951
Zn Content, m%	9.8	ASTM D4951
pH Value	6.1	SH/T 0394-1996, Annex A
Water Content, m%	0.02	ASTM D95

●Package, Storage and Transportation

The product is packed with iron barrels, with a net weight of 200Kg/barrel, suitable for all means of transport.

For storage and transportation temperature, it shall not surpass 45°C. The product is offered with a guarantee period of two years.

In case of accidental contact with skin, wash it off thoroughly with water and detergents.

RF2204 Antioxidant and Corrosion Inhibitor

●Product Introduction

RF2204 is Zinc primary-secondary Alkyl Dithiophosphate, a kind of antioxidant and anti-corrosion agent. This product features good storage and hydrolysis stability, outstanding anti-wear, favorable anti-oxidation performance, and medium thermal stability. It can be widely adopted in various oils, especially suitable for medium and high grade low-temperature anti-wear hydraulic oil and industrial oil. The normal dosage is 0.5%-2.5%.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Amber transparent liquid	Visual Inspection
Color Number	1.2	ASTM D1500
Flash Point (COC), °C	195	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	12.3	ASTM D445
Density (20°C), kg/m ³	1120	ASTM D4052
S Content, m%	16.8	ASTM D1552
P Content, m%	8.2	ASTM D4951
Zn Content, m%	9.4	ASTM D4951
pH Value	5.9	SH/T 0394-1996, Annex A
Water Content, m%	0.02	ASTM D95

●Package, Storage and Transportation

The product is packed with iron barrels, net weight of 200Kg/barrel, suitable for all means of transport.

For storage and transportation temperature, it shall not surpass 45°C. The product is offered with a guarantee period of two years.

In case of accidental contact with skin, wash it off thoroughly with water and detergents.

RF2204B Zinc Mixed Iso-octanol & Secondary Butanol

Dithiophosphate

●Product Introduction

RF2204B is a zinc mixed primary & secondary alkyl dithiophosphate. When added into oils it can inhibit oils from oxidising, prevent bearing corrosion, as well as reducing the wear. This product is used extensively in engine oil formulations to prevent wear of piston rings, cylinder liners, cam and tappets as well as deploying its antioxidant performance. It has good anti-oxidation and extreme pressure performance, fine hydrolytic and thermal stability. It is used for blending with high-quality additives to make a variety of products for industrial and engine oil applications. The treatment level would normally be expected to be in the region of 0.1% to 2.0%.

●Product Technical Index

Item	Index	Test Method
Appearance	Light yellow to amber transparent liquid	Visual Inspection
Flash Point (COC), °C	160min	ASTM D-92
Kinematic Viscosity (100°C), mm ² /s	6.0~14.0	ASTM D-445
Density (20°C), kg/m ³	1080~1180	ASTM D-4052
S Content, m%	14.5~18.1	SH/T0303 or ASTM D-4951
P Content, m%	7.7~8.3	SH/T0296 or ASTM D-4951
Zn Content, m%	8.4~9.4	SH/T0226 or ASTM D-4951

●Package, Storage and Transportation

The product is packed with iron barrels, with a net weight of 200Kg/barrel, suitable for all means of transport.

For storage and transportation, the temperature of the product shall not surpass 45°C. The product is offered with a guarantee period of two years.

This product is non-flammable, non-explosive, and non-corrosive, thus needs no special protection.

RF2205 Antioxidant and Corrosion Inhibitor

●Product Introduction

RF2205 is Zinc Secondary -Secondary Dialkyl Dithiophosphate, a kind of antioxidant and anti-corrosion agent. This product features excellent anti-oxidation and anti-wear performance, which can effectively solve the problem of engine cam and tappet's abrasion and corrosion. It can be widely adopted in various oils, especially for high grade gasoline engine oil. The general dosage is 0.5%-2.5%.

●Product Technical Index

Item	Typical Value	Test method
Appearance	Amber transparent liquid	Visual Inspection
Color Number	0.8	ASTM D1500
Flash Point (COC), °C	190	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	9.2	ASTM D445
Density (20°C) kg/m ³	1110	ASTM D4052
S Content, m%	16.9	ASTM D1552
P Content, m%	8.1	ASTM D4951
Zn Content, m%	9.2	ASTM D4951
pH Value	5.8	SH/T 0394-1996
Moisture, m%	0.02	ASTM D95

●Package, Storage and Transportation

The product is packed with iron barrels, with a net weight of 200kg/barrel, suitable for all means of transport.

The temperature of storage and transportation shall not surpass 45°C. The shelf life of product is 2 years.

In case of contact with skin accidentally, wash it off thoroughly with water and detergents

RF2206 Antioxidant and Corrosion Inhibitor

●Product Introduction

RF2206 is Zinc Long-chain Alkyl Dithiophosphate, a kind of antioxidant and anti-corrosion agent. This product has excellent thermal and hydrolysis stability, outstanding anti-oxidation and anti-wear performance, which can effectively solve the problem of engine cylinder sleeve and piston's abrasion under high temperature and pressure. It can be widely adopted in various oils, especially for high grade diesel engine oil and gasoline engine oil. The general dosage is 0.5%-2.5%.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Amber transparent liquid	Visual Inspection
Color Number	0.8	ASTM D1500
Flash Point (COC), °C	191	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	39.6	ASTM D445
Density (20°C), kg/m ³	1131	ASTM D4052
S Content, m%	17.2	ASTM D1552
P Content, m%	9.1	ASTM D4951
Zn Content, m%	10.2	ASTM D4951
pH Value	6.2	SH/T 0394-1996
Moisture, m%	0.04	ASTM D95

●Package, Storage and Transportation

The product is packed with iron barrels, with a net weight of 200kg/barrel, suitable for all means of transport.

The temperature of storage and transportation shall not surpass 45°C. The shelf life of product is 2 years.

In case of contact with skin accidentally, wash it off thoroughly with water and detergents

RF3323 Ash-free Antioxidant

●Product Introduction

RF3323 Antioxidant is a kind of multipurpose ash-free additive. It not only boasts outstanding anti-oxidation performance, but also has great abrasion resistance and extreme pressure properties. Meanwhile, it has excellent compatibility with other additives. This product can be used in steam turbine oil, hydraulic oil, gear oil, internal combustion engine oil and other variety of oils to improve their anti-oxidation and abrasion resistance. It's also an effective extreme-pressure additive for lubricating grease.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Light yellow green /Light brown transparent liquid	Visual Inspection
Flash Point (COC), °C	200	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	15.80	ASTM D445
Density (20°C), kg/m ³	1058	ASTM D4052
N Content, m%	6.50	ASTM D3228
S Content, m%	29.60	ASTM D1552

●Package, Storage and Transportation

The product is packed with iron barrels, 200kg/barrel or other packing methods consulting with clients.

Suitable for truck transport, railway transport and ocean transport.

The temperature of storage and transportation shall not surpass 45°C. The shelf life of product is 2 years.

The product is non-toxic and non-corrosive, can be thoroughly washed out with detergent in case of contact with skin accidentally.

RF5057 Butyl Octyl Diphenylamine

●Product Introduction

RF5057 butyl octyl diphenylamine is an excellent high-temperature antioxidant, it has good thermal stability, prominent oxidation resistance under high temperature, good oil solubility as well as compatibility to other additives. It can be widely used for high-grade ICE lubricants, heat conducting oils, high-temp. chain oils, hydraulic oils, compressor oils, turbine oils and other industrial lubricant oil, all kinds of lubricating grease and fuel oil, the general dosage is 0.3-0.5%.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Light yellow/ brown clear liquid	Visual Inspection
Flash Point (COC), °C	198	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	10	ASTM D445
Density (20°C), kg/m ³	971	ASTM D4052
Base Number, mgKOH/g	179	ASTM D2896
N Content, m%	4.5	ASTM D3228
Moisture, m%	0.02	ASTM D95

●Features

Different alkyl substitution is rationally arranged and controllable;

Lower free amine content, less than 1%;

Good compatibility, more significant effect when compounded used with amine-type antioxidants.

●Package, Storage and Transportation

The product is packed with iron barrels, 180kg/barrel or other packing methods consulting with clients.

Suitable for truck transport, railway transport and ocean transport.

The temperature of storage and transportation shall not surpass 45°C. The shelf life of product is 2 years.

RF5067 P,p'-Dinonyl Diphenylamine

●Product Introduction

RF5067 is an excellent high-temp. amine antioxidant. It has good thermal stability, prominent oxidation resistance under high temperature, good oil solubility as well as compatibility to other additives. It's widely used in high-grade ICE lubricants, heat conducting oil, high-temp. chain oil, hydraulic oil, compressor oil, turbine oil and other industrial lubricant oil, all kinds of lubricating grease and fuel oil, the general dosage is 0.3-0.5%.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Yellow or red-brown to brown clear liquid	Visual Inspection
Density (20℃), kg/m ³	945	ASTM D4052
N Content, m%	3.5	ASTM D3228
Water Content, m%	0.03	ASTM D95
Kinematic Viscosity (40℃), mm ² /s	455	ASTM D445
Flash Point (PMCC), °C	155	ASTM D93

●Features

Good high temperature oxidation resistance, especially outstanding antioxidant durability, significant effect on inhibiting the late oxidation of oil; excellent high temperature thermal stability.

Different alkyl substitution is rationally arranged and controllable, lower free amine content.

Good compatibility, and has synergistic effect when compounded with other antioxidants, especially combined used with ester-phenolic antioxidants.

●Package, Storage and Transportation

The product is packed with iron barrels, 180kg/barrel or other packing methods consulting with clients.

Suitable for truck transport, railway transport and ocean transport.

The temperature of storage and transportation shall not surpass 45℃. The shelf life of product is 2 years.

RF1135 Ester-Phenolic Antioxidant

●Product Introduction

RF1135 Ester-phenolic antioxidant is a new high-temperature antioxidant with superior performance, it has good high thermal stability, outstanding anti-oxidation performance in high temperature, high oil solubility, and high compatibility with other additives. It's widely used in high-grade ICE lubricants, heat conducting oil, high-temp. chain oil, hydraulic oil, gear oil, turbine oil and other industrial lubricant oil, all kinds of lubricating grease and fuel oil, the general dosage is 0.3-0.5%.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	Light yellow transparent liquid	Visual Inspection
Flash Point (COC), °C	195	ASTM D92
Kinematic Viscosity (100°C), mm ² /s	7	ASTM D445
Density (20°C), kg/m ³	961	ASTM D4052
Acid Value, mgKOH/g	0.4	ASTM D974
Water Content, m%	0.02	ASTM D95
Ash Content, m%	0.01	ASTM D482
Effective Content, m%	98.0	GC

●Product Features

Light color, low chrominance;

High content of effective constituent;

Good compatibility, more significant effect when compounded with amine-type antioxidants.

●Package, Storage and Transportation

The product is packed with iron barrels, 180kg/barrel or other packing methods consulting with clients.

Suitable for truck transport, railway transport and ocean transport.

The temperature of storage and transportation shall not surpass 45°C. The shelf life of product is 2 years.

RF1035 Thioether and Phenolic Ester Type Antioxidant

●Product Introduction

RF1035 is a thioether and phenolic ester type antioxidant, low toxicity, can be used for stability in easy thermo-oxidative degradation of polymers and other organic materials. It is widely used in polyolefin, elastomers (EPDM), petroleum products and so on. In the field of lubricating oils, it has excellent compatibility with other additives and outstanding oxidation resistance when applying in higher conditions. Especially when used with amine type antioxidants, it can effectively control the increase of oil viscosity and decrease the deposit formation. It's widely used in high-grade ICE oil. And it also has good effect in industrial lubricating oils. The general dosage in oil is 0.1~0.5%.

●Product Technical Index

Item	Typical Value	Test Method
Appearance	White or mild yellow powdered crystal	Visual Inspection
Melting Point, °C	65.0	GB/T617
Ash Content, m%	0.1	ASTM D482
S Content, m%	5.1	ASTM D1552

●Package, Storage and Transportation

The product is packed in 25kg paper-plastic compound bags or 25kg carton barrels with plastic bag lining or customized with the requirements of clients.

Suitable for various modes of transport.

The product can't be exposure or high temperature, should be stored in ventilating cool dry place. The storage temperature should not surpass 45°C. And the shelf life of product is 2 years.

RF1200 Gasoline Detergent

●Product Introduction

RF1200 is the new type of detergent produced by introducing the newest scientific achievements of Sinopec Petrochemical Research Institute. Its good thermal stability can effectively clear the deposits of nozzle and inlet valve. And it can be decomposed immediately, thus inhibiting the generation of combustors' deposit. Its technical index of rust protection, demulsification and antioxidant all meets the requirements of GB19592-2004 motor gasoline detergent national standard.

●Dosage reference

The dosage is 1000ppm, suitable for all type of (including air inlet jet and direct injection)gasoline engine.

●Product Technical Index

Items	Technical index	Test method
Flash Point (COC), °C	≥ 50	ASTM D93
Corrosion rate/%	≤ 5	GB/T19230.1
Flow point/°C	≤ -15	ASTM D97
Simulation Inlet Valve Sediment Decrease Rate/%	Report	GB19592-2004 Appendix B
Fuel Nozzle Cleanliness, Loss of Flow/%	≤ 5	GB/T19230.3
Demulsification /Grade Interface Seperation	$\leq 1b$ ≤ 2	GB/T19230.2
Inlet Valve Sediment Weight Method 1% Method 2%	≤ 25 ≤ 80	GB/T19230.5 GB/T19230.6
Total Combustion Deposit Increase Method 1% Or Method 2%	≤ 40	GB/T19230.5 GB/T19230.6

●Package, Storage and Transportation

The shelf life of product is 2 years. The temperature of storage shall not surpass 45°C. It is conducted in reference with SH/T0164. It is chemical product, shall be kept away from fire and in dark storage. In case of contact with skin accidentally, wash it off thoroughly with water and detergents.

RF1202 Gasoline Detergent

●Product Introduction

RF1202 gasoline detergent additive is the Mannich base type of detergent products which is produced under the cooperation of our company and Sinopec Research Institute. The product can effectively inhibit the sediment generation of gasoline engine fuel nozzles, valves, and other key parts, Keep the engine fuel system and fuel system cleaner and engine life longer as well as improve the fuel economy.

The general additive dosage is 200ppm and 400ppm. And in the national quality supervision and test center for testing of petroleum products, our product meets the GB19592 Motor Gasoline Detergent Standards Requirements.

This product can also modulate variety of engine oil circuit and lubricate system exempt opens detergent.

●Product Technical Index

Item	Typical Value	Test method
Appearance	Clear	Visual inspection
Kinematic Viscosity (40°C), mm ² /s	150	ASTM D445
Flash Point (PMCC), °C	69	ASTM D93
Density (20°C), kg/m ³	926	ASTM D4052
N Content, m%	1.5	ASTM D3228
Mechanical Impurities, m%	0.02	ASTM D473
Water Content, m%	0.02	ASTM D95

●Package, Storage and Transportation

The product is packed with iron barrels, with a net weight of 200Kg/barrel. It is suitable for container transport and truck transport. The temperature of storage shall not surpass 45°C. To avoid contact with strong oxidants when used. The shelf life of product is 2 years.

In case of contact with skin accidentally, wash it off thoroughly with water and detergents.

RF1205 Gasoline Detergent

●Product Introduction

RF1205 gasoline detergent additive is the Mannich base type of detergent products which is produced under the cooperation of our company and Sinopec Research Institute. The product can effectively inhibit the sediment generation of gasoline engine fuel nozzles, valves, and other key parts, Keep the engine fuel system and fuel system cleaner and engine life longer as well as improve the fuel economy.

This product can also modulate variety of engine oil circuit and lubricate system exempt opens detergent.

●Ingredients and Usage

The main ingredients are Mannich base, demulsifiers for oils, carrier oils, dilution and rust-proof agent.

RF1205 can be used after directly diluted with the ratio of 1:1. The suggested dosage is 1000ppm.

●Product Technical Index

Item	Typical value	Test method
Appearance	Clear	Visual inspection
Kinematic Viscosity (40℃), mm ² /s	10.5	ASTM D445
Flash Point (PMCC), °C	70	ASTM D93
Density (20℃), kg/m ³	942	ASTM D4052
N Content, m%	0.42	ASTM D3228
Mechanical Impurities, m%	0.02	ASTM D473
Water Content, m%	0.02	ASTM D95

●Package, Storage and Transportation

The product is packed with iron barrels, with a net weight of 200Kg/barrel. It is suitable for container transport and truck transport. The temperature of storage shall not surpass 45℃. To avoid contact with strong oxidants when used. The shelf life of product is 2 years.

In case of contact with skin accidentally, wash it off thoroughly with water and detergents.

RF1206 Gasoline Detergent

●Product Introduction

RF1206 gasoline detergent is produced by we and Sinopec Petrochemical Science Institute, on the base of Mannich base detergent technology and further compounded other gasoline additives. In comparison of RF1205, this product can not only inhibit the sediment generation of gasoline engine fuel nozzles, valves and other vital parts, but also inhibit the growth of sediment of combustor, keep the motor fuel and fuel intake system cleaning, and improve the fuel economy functions. In addition, this product has a good dispersion of rust and antioxidant properties and other incomparable advantages.

●Ingredients and Usage

It can be used after directly diluted with the ratio of 1.2:1. The suggested dosage is 1000ppm.

●Product Technical Index

Item	Typical value	Test method
Appearance	Clear	Visual inspection
Kinematic Viscosity (40°C), mm ² /s	7.7	ASTM D445
Flash Point (PMCC), °C	70	ASTM D93
Density (20°C), kg/m ³	944	ASTM D4052
N Content, m%	0.33	ASTM D3228
Mechanical Impurities, m%	0.02	ASTM D473
Water Content, m%	0.02	ASTM D95

●Package, Storage and Transportation

The product is packed with iron barrels, with a net weight of 200Kg/barrel. It is suitable for container transport and truck transport. The temperature of storage shall not surpass 45°C. To avoid contact with strong oxidants when used. The shelf life of product is 2 years.

In case of contact with skin accidentally, wash it off thoroughly with water and detergents.